DOCUMENT RESUME

ED 306 360 CE 052 256

AUTHOR Anderson, William W.; Stewart, Oran J.
TITLE Testing Job-Specific Literacy of Industrial Workers: Cooperation between Educators and Industry.
PUB DATE 29 Mar 89
NOTE 11p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, March 29, 1989).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adult Basic Education; *Adult Literacy; Communication Skills; *Functional Literacy; *Functional Reading; Industrial Personnel; *Job Performance; Reading Research; Reading Skills; Reading Tests; *Test Construction; Vocational Evaluation
IDENTIFIERS *Job Literacy; Nelson Denny Reading Tests; Pennsylvania

ABSTRACT

A test of job-specific literacy, called the McCoy Assessment of Worksite Literacy Abilities (MAWSLA), could not predict the job success of the 100 employees who took it. The 108-item test was based on literary tasks encountered by employees in the course of a routine day at McCoy Electronics Company, a 560-employee firm in Pennsylvania. The instrument was developed after observation; collection of literary samples that employees routinely had to read (e.g., memos from management, safety instructions, personnel forms, and operating instructions); interviews with workers, supervisors, and management; and two pilot tests. After taking the 30-minute MAWSLA, subjects took the Nelson Denny reading tests. Multiple linear regression determined the extent to which MAWSLA scores accounted for variance in job performance ratings and in an "employee value index," constructed from performance ratings, time missed from work, and number of days on the job. Other variables added to the prediction formula were age, length of employment, and scores on the Nelson Denny tests. The analysis accounted for only 6 percent of variance in the employee value index and only 10 percent in job ratings. Use of the Pearson-r revealed no correlation between the MAWSLA and the index, and a correlation of only .21 between the MAWSLA and performance ratings. (CML)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED306360

TESTING JOB-SPECIFIC LITERACY OF INDUSTRIAL WORKERS

Cooperation Between Educators and Industry

Paper Presented to the

American Educational Research Association

Special Interest Group on Training in Business and Industry

San Francisco, California

March 29, 1989

William W. Anderson, Shippensburg University

Oran J. Stewart, Shenandoah College

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

W. Anderson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CE053356

BEST COPY AVAILABLE

BACKGROUND

A great deal of recent attention has been focused upon literacy in the workplace. Many news stories imply that inadequate literacy is a major contributor to our waning competitiveness in the world marketplace. While there is no doubt that this is an important concern of American industry, it is open to question as to what extent literacy jeopardizes continued profitability and how it operates as a factor in effective job-performance.

The research of Mikulecky(1982) confirms that the workplace in America is more literacy-intensive than most would imagine and he concludes that the typical blue-collar worker generally spends as much on-the-job time engaged in literacy tasks as does the typical high school student. Economic forecasters and market analysts point to the growing use of inexpensive foreign labor for uncomplicated, menial tasks with corresponding increases in literacy-levels required by the more sophisticated, demanding tasks left to American workers.

This economic trend is compounded by the quickening pace of technology and gradually increasing level of literacy required for American workers to compete successfully. There is clear evidence that both society and our workplaces demand significantly greater literacy levels than ever before. While literacy in an absolute sense seems to be on the increase, the gap between the minimal level required to function effectively and the level of the average American citizen is ever widening. We "up-the-ante" as time passes keeping literacy just beyond the reach of many Americans.

Yet another factor compounding the literacy problem in the workplace is the low transfer effect of generalized literacy ability to specific domains. Those who do well in the read-t -remember tasks so typical of our public schools often falter when confronted with the read-to-do literacy required in the workplace. The work of Sticht(1980) with the Army has documented this problem making it clear that generalized reading ability does not transfer directly to specific domains.

PROBLEM

Given the above factors impacting upon the workplace literacy problem, how can the resources of higher education be brought to bear in mutually-beneficial cooperative arrangements? What role can literacy education professionals play in assisting industry to deal with these problems?

It seemed reasonable to us that a test of job-specific literacy might be a valuable tool for human resource professionals in making wise decisions about employment, promotion and retention. It might have the potential to identify those in the scarce labor market of our area who would be able to become valuable employees despite the lack of a high school diploma or GED equivalency. Moreover, it could be used as a tool for referrals from the job-service agencies to industries.

We guessed that scores on a carefully-developed test of job-specific literacy would account for a substantial percentage of the variance on measures of job performance. Given the problems noted in the literature with generalizing literacy performance to specific circumstances(Sticht, 1980), we also felt that any measure we might develop would likely be more predictive of job success than a standardized reading test.

PROCEDURES

Identification of Target Industry

We decided to target medium-sized industries for our research. The corporate giants, we reasoned, generally have the resources to handle these problems on their own. Medium-sized industries, being large enough to have carved their niche in the marketplace and to have grown beyond the struggle to survive and yet too small to handle literacy problems on their own, seemed most in need of the help we could provide. Also, medium-sized industries are more likely to recognize that literacy is a problem that is beyond the scope of that which they can handle on their own.

The first industry that we contacted was JLG Industries, a manufacturer of cranes and aerial lifts in a community about thirty miles from Shippensburg University. JLG was of interest to us because one of their executives had been quoted in a Wall Street Journal article ("Employers Take Over Where Schools Failed to Teach the Basics," Jan. 22, 1981) about workplace literacy. He had said that low-level literacy was a vexing problem costing JLG millions of dollars annually. Also, the founder and CEO of this industry is a member of the Board of Trustees for the University and one of our major benefactors.

Reaction from the current human resource director at JLG to my telephone query was quite interesting. He said that the person quoted by the Wall Street Journal had been a great

embarrassment to the company and his comments led to problems with their employees who construed them as disparaging. Following this difficulty they were cautious and reluctant to make any further overtures that might suggest a lack of confidence in the ability of their employees.

So that our research could be generalized as widely as possible, we identified an industry that has many local sites. The electronics crystal industry is a burgeoning concern in our area with five different companies operating within a ten mile radius of Carlisle, Pennsylvania, a community of about 22,000.

After a mail solicitation of human resource directors at these area firms followed by phone calls and personal meetings, we identified McCoy Electronics Company as the one that was most receptive to our work and seemed to have the most enlightened management. McCoy is a subsidiary of the California-based Oak Industries. It employees about 560 persons at two local sites in the manufacture of crystal electronic components.

Concerns were expressed initially about compromising of company secrets that may lead to loss of its competitive edge. After providing assurances in writing that we would be sensitive to this concern and retain the confidentiality of whatever we learned about their industrial procedures, our work proceeded smoothly.

Test Development

We then arranged to spend several days at McCoy touring the work areas to observe the literacy tasks encountered in the course of a routine workday. Samples were collected of safety instructions, personnel forms, employee memos from management, operating instructions and other work-related items requiring use of literacy skills. Interviews were conducted with workers, supervisors and management to ascertain the precise literacy demands that workers confronted.

The recent literature regarding literacy testing was reviewed so that test items could be designed to reflect the best knowledge of assessment. We relied particularly to the impressive work of Valencia and Pearson(1987) and of Simpson(1987) in literacy assessment.

We then proceeded to develop a test for McCoy employees using the materials and information that we had obtained. Test development consisted of conctructing and critiquing items and item formats between the two of us followed by administration to a group of 40 university students in an assessment class. The test was refined based upon their suggestions and areas of confusion. It was again further refined following the administration to 20 McCoy supervisory-level employees. This resulted in a 108 item test containing 11 different formats. In order to guarantee a measure of "ecological" validity we prepared a manila folder for each subject to use as a reference in taking the test. It contained a copy of the company personnel manual as well as samples of forms, memos and other items upon which the test was based.

One of the problems in test development was selection of materials that would be of inherent interest to employees but also acceptable to management. For example, a memo from the CEO to all employees about attempts at union organizing was used as a basis for some initial test questions. We were advised that this would be unacceptable because this was an issue that they did not want to bring to employees' attention once again. Elimination of memos of this sort leaves those remaining on such unstimulating topics as the United Way campaign. Despite this small problem, we were able to select enough relevant and interesting material to proceed with test development with some sense of confidence that our sample of materials was truly representative of those encountered by entry-level employees in the course of their routine workday.

DATA COLLECTION PROCEDURES

Our resulting test instrument, the "McCoy Assessment of Worksite Literacy Abilities" or MAWSLA, was administered to 100 of the most recently hired employees last December. The test was untimed but was easily completed by nearly all employees in about 30 minutes. Following this test we also administered the Nelson-Denny Reading Test(1973).

A letter was then sent to all employees participating in the study reporting both their Nelson-Denny and MAWSLA scores and providing them with interpretive information.

Just a few weeks ago we collected data from employees personnel records. We were interested in four factors that would enable us to determine an "employee value index." These factors were those measurable dimensions that would

enable one to draw inferences about the subject's worth to the company. They enabled us to select measurable traits that the human resource director suggested might define those regarded as "ideal" employees who are of great worth to the company. The factors identified were (1) performance rating by company supervisor, (2) time missed from work, (3) perseverance as measured by number of days on the job without resigning, and (4) amount of supervision required beyond routine training to enable one to become a productive employee.

Performance ratings seemed to have been conscientiously and carefully done by the respective shop supervisors. Time missed from work, however, was a more tenuous measure. Since some subjects had been employed for only three months at the time of data collection while others had been employed for over a year, this measure was not consistently valid for all employees. Also, there was no way of determining those who had been absent for legitimate, uncontrollable circumstances or those whose absence was a form of malingering. Amount of supervision required was a variable that we wanted in the mix for determining the "employee value index" but this was not available in time for this presentation. It will, however, be used for subsequent analysis.

ANALYSIS OF DATA

Multiple linear regression was used to determine the extent to which the MAWSLA could account for variance in two dependent variables, employee performance rating and employee value index. Other variables added to the prediction formula were age, length of employment, Nelson-Denny vocabulary, and Nelson-Denny comprehension scores.

FINDINGS

As table 1 suggests, our findings were disappointing and did not turn out as we had guessed they would. After a two year investment of time and energy, this is a point at which many researchers are tempted to forget scientific rigor and become "creative." Using the Pearson-r, there was no correlation between the MAWSLA and the employee value index and only a correlation of .21 between the MAWSLA and employee performance ratings. Multiple linear regression results were able to account for only 6% of variance in employee value ratings and only 10% in employee performance ratings.

Table 1

Pearson Correlations for Worksite Literacy Variables
(Correlations of <.2 not listed)

	Age	Length of Employment	N-D Voc.	N-D Comp.	MAWSLA	Perf Rating	Value Index
Age	-	-	-	-.3	-.2	-	-
Length of Employment	-	-	-	-	-	-	.2
N-D Voc.	-	-	-	.7	.7	-	-
N-D Comp.	-.3	-	.7	-	.6	-	-
MAWSLA	-.2	-	.7	.6	-	.2	-
Perf Rating	-	-	-	-	.2	-	-
Value Index	-	.2	-	-	-	-	-

CONCLUSIONS & IMPLICATIONS

Obviously we were not able to demonstrate that worksite literacy as measured by our test is a significant variable in the determination of job success. This conclusion was both surprising and disappointing. What then explains our inability to confirm our hunches empirically despite careful procedures and a reasonably large sample size?

One explanation may be that literacy operates in the workplace as but one of many quality-of-life factors indirectly related to job success. An analogous relationship may be the availability of good-quality care for workers' children and job success. We generally recognize this as a critical factor related to employee satisfaction(i.e. good quality, safe and convenient child care). It would be difficult, however, to produce hard data demonstrating a direct relationship between child care arrangements and overall employee job performance. Difficulty in documenting such linkages may be due in part to the large number of difficult-to-measure variables that

lead to good job performance. Personality factors, for example, have been repeatedly cited as being more predictive of "success" in the world of work than school grades. Nevertheless, we continue to accept uncritically the need for students to earn good grades.

Another possible reason for the lack of relationship between literacy and on-the-job effectiveness may be as suggested in a recent article by psycholinguist, Frank Smith(1989). Smith avers that we have oversold literacy and that, despite its value for adding pleasure to life and empowering people by raising consciousness, etc., it is not nearly the panacea for all social ills that we are inclined to pretend. In fact, he suggests that illiteracy misconstrued is often used as a "weapon" and as such it detracts attention from concerns that relate more directly to basic human welfare.

There is abundant evidence in recent literature about literacy that rhetoric is inconsistent with reality. For example, Diekhoff's review of the research literature in adult literacy(1988) suggests that even those adult literacy programs reporting significant gains may be far from achieving gains of functional significance for either society of the majority of learners. He concludes, "The misimpression that 'everything is fine' in adult literacy stems not so much from research design flaws as from a consistent unwillingness on the part of researchers in the area to criticize efforts in service to a cause as important as adult literacy."(1988, p. 629)

It may be that, despite rhetoric to the contrary, literacy has become a scapegoat for frustration with the loss of America's competitive edge in the world marketplace. In reality, there is no compelling evidence that waning literacy has had a measurable impact upon America's competitiveness. Even if all workplace literacy concerns could be magically solved, it is not reasonable to assume that this would then enable American industry to become significantly more competitive.

One prospect for better understanding the impact of literacy on the workplace is through further studies using research designs similar to those of Mikulecky(1982) but targeted toward specific industry groups. These could determine the extent to which the workplace in a particular industry is literacy-intensive. This would then enable us to target those employees in those industries for appropriate assistance.

Given the absence of data to support the value of workplace literacy, do we then urge industry to continue to express concern for their employee's in this area? Is it in the interest of American industry to do so? We believe that it definitely is. In the same manner that concern is expressed by good employers for child care and other areas of human need, they must do so for literacy. An important lesson from the Japanese is the need for developing employee loyalty. One way of doing this is for employers to express concern for all quality-of-life factors.

We believe that literacy level has a type of "face" validity in the workplace similar to that of good grades in school. It seems also clear that our assessment tool(i.e. the MAWSLA) is valid as a screening instrument for employment in the industry for which it was developed despite our inability to produce supportive data. The process by which it was developed in itself guarantees this. For this reason we will recommend its use as a means of screening potential employees and as a tool for identifying those who are capable of higher levels of responsibility.

Three types of validity are adequately addressed through the process that we adhered to in constructing the instrument. It has "face" validity in that anyone acquainted with the demands of the workplace at the McCoy Electronics can review the test and would agree that it asks for performance of the same literacy tasks that are in fact encountered daily by McCoy employees. It also has "ecological" validity in that it was given in a circumstance that is nearly identical to the actual conditions in which literacy tasks are performed on the job. Finally, it has "construct" validity in that it reflects the best, most recent research on literacy assessment.

There is, nevertheless, no indication of "predictive" validity. It does have a measure of "concurrent" validity due to its reasonably high correlations with the Nelson-Denny Reading Test.

One special benefit of using such an instrument is as a tool for raising the consciousness of prospective employees that there is a literacy dimension to their employment that requires their careful attention. Such a message will, we believe, help to instill pride in employees by communicating that there are special skills involved in their jobs beyond the routine tasks performed in the workshop.

With more carefully controlled studies a stronger link may be able be demonstrated between workplace literacy and job

performance. We will follow through with our study by gathering and analyzing data when all subjects have been employed for a full year and when need-for-supervision ratings can be added to the mix for determining overall employee value.

Given the serious questions that have been raised about validity of nearly all existing commercially-produced instruments for literacy assessment, it is not surprising that problems and disappointments have arisen in developing our instrument. With this in mind, we feel that our efforts in this specialized area of assessment are quite worthwhile and represent a significant contribution to research.

REFERENCES

Brown, James I., Nelson, M. J. and Denny, E.C. The Nelson-Denny Reading Test. Boston: Houghton Mifflin Company, 1973.

Diekoff, George M. "An appraisal of adult literacy programs: Reading between the lines," Journal of Reading, April, 1988.

Hymowitz, Carol "Employers take over where schools failed to teach the basics," Wall Street Journal, January 22, 1981.

Mikulecky, Larry "Job literacy: The relationship between school preparation and workplace actuality," Reading Research Quarterly, XVII, 3, 1982.

Simpson, Michele L. "Alternative formats for evaluating content area vocabulary understanding," Journal of Reading, October, 1987.

Smith, Frank "Overselling Literacy," Phi Delta Kappan, January, 1989.

Sticht, Thomas G. Literacy and vocational competence. Columbus, Ohio: National Center for Research Report 2, no. 12. Washington, D.C.: Department of Labor, April, 1980.

Valencia, Sheila & Pearson, P. David "Reading assessment: Time for a change," The Reading Teacher, April, 1987.